

#### IV. REMARKS

##### A. Status of the Claims

Claims 1 to 34 were pending in this application. In this amendment, Applicants are cancelling Claims 1 to 34 without prejudice and is introducing new Claims 35 to 44. No new matter is introduced by this Amendment.

##### B. Claim Rejections Under 35 USC § 112

Claim 26 has been cancelled.

##### C. Claim Rejections – 35 USC § 102

Applicants have carefully considered the points raised by the Examiner, and have sought in the new claims to define the invention more precisely to insure that it is clearly distinguished from the documents referred to by the Examiner, namely Shoureshi, Hodgson et al, and MacMartin et al. Applicants can appreciate why the Examiner may have considered the disclosures of these documents to be of some relevance, and in revising the claims have set out the clear distinctions over the prior art.

In particular, Shoureshi discloses a vibration control system for a vehicle, which detects, among other things, audio signals and develops nulling signals to drive the structure (e.g. an adjustable engine mount) or an adjustable suspension component (e.g. body mounts) to attenuate vibration (Col 4, lines 48-59). Applicants acknowledge that the general principle of using antiphase signals to attenuate vibrations well-known. However, new Claims 35 to 44 are directed to unique and non-obvious devices which are capable of being used with windows and, in relation to Claims 40 to 44, other surfaces, to detect noise, such as airplane noise or traffic noise external to the building or just ambient noise arising from other people nearby, and to locally cancel or attenuate the noise by coupling an acoustic wave into the window or panel to cause it to radiate the anti-phase acoustic signal. This contrasts with existing systems which seek to reduce vibration and low frequency noise within a space such as an aircraft body or a vehicle body.

Hodgson et al is concerned with an active noise and vibration cancellation system using loudspeakers to emit a cancellation signal for the higher frequencies, and structural actuators for the lower frequencies. However, it should be noted that all the practical examples illustrated in the patent specification relate to frequencies at the lower end of the spectrum, below 400Hz and mostly below 200Hz. It is directed towards the aircraft situation, where the noise and vibration are due to the engines and are experienced within the body of the aircraft. The frequencies emitted by the engines tend to be more uniform than, say, incidental noise in a building or public location, for example the noise of aircraft or traffic external to the building, or the noise generated by a large

number of people in an enclosed space such as a bar, in each case where higher frequencies are experienced in addition to the lower frequencies in the patent.

MacMartin et al does not, in fact, make any reference to a damaging attack of the type experienced in vandalism, for example. Instead, it refers to *"disturbing force at the helicopter rotor"* and to *"undesired disturbances ... typically due to vibratory aerodynamic loading of the rotor blades, gear clash or other source of vibrational noise"*. There is no suggestion that it should listen for a potential attack on a surface and raise an alarm when one is detected. The sounds detected in MacMartin et al do not represent the sounds generated by a person within the space; there is only a reference to "vibrational sound", which in the context of MacMartin means the sort of noises experienced in a helicopter. Speech is certainly not such a sound; in the average helicopter speech cannot be heard without an intercom system and headphones.

The Examiner further suggests that MacMartin et al discloses the alerting signal being used to control the operation of lighting and/or heating within the space. The passage he refers to merely discloses generating a vibration cancelling force by means of actuators. There is no disclosure of an alerting signal in MacMartin. However, Applicants have cancelled Claim 15. There is no disclosure in MacMartin et al of the sensor being incorporated into the actuator; the references indicated by the Examiner quite clearly indicate these as being separate both in type and location.

To facilitate favorable examination of the application, the claims directed to detection of a damaging attack have been cancelled from the present application. Applicants reserve the right to make these and other claims the subject of a divisional application.

#### D. Claim rejections -- 35 USC § 103

Although the Applicants have cancelled all previous claims, the Applicants address the art cited by the Examiner.

The Examiner rejected original Claim 5 as unpatentable over Shoureshi in view of Wan. Applicants agree with the Examiner that Wan mentions magnetostrictive actuators, but they point out that this is not in the context of sound. Wan makes it clear that in the case of sound, the control transducers are speakers, and in the case of vibration the transducers might include piezoelectric ceramics and magnetostrictive actuators. Claims 1 and 5 have been cancelled, but Wan does not teach the use of a magnetostrictive actuator to produce antiphase sound.

The Examiner rejected Claim 6 as unpatentable over Shoureshi in view of Todd. Todd discloses the use of a piezoelectric strain actuator element to induce a vibratory moment in a blade spring and shoe assembly for a driving chain to damp vibration in the chain. Claim 6 has been cancelled, but the Applicants observe that the use of the piezoelectric actuator is in a completely different field to that of the present invention and submit that there would be no reason for one skilled in the art to look in this different field when seeking to address the problems which the present invention sought to overcome.

The Examiner rejected Claim 7 as unpatentable over Shoureshi in view of Luo et al, referring particularly to Col 1, lines 24-31 of Luo as indicating that the body is a flexible panel. However, the passage referred to by the Examiner does not make any reference to panels, flexible or otherwise, instead describing the mounting of the turbine rotor. Luo et al discloses a vibration control system for a rotary machine having a vibration damping device for imparting a reaction force to the rotor, and the Applicants believe that again this is in a completely different field to that of the present invention as now defined in the new claims. One skilled in the art seeking to solve the problem of ambient sound reduction within a room or adjacent to a panel would not find the solution in Luo, whether or not considered in combination with Shoureshi. Moreover, there is no reason for one skilled in the art to consider combining these disclosures from quite disparate fields.

Claims 17 & 19-21 were rejected by the Examiner as being unpatentable over Todd et al in view of Shoureshi. As indicated above, Todd is not concerned with ambient noise control, but in damping vibrations in a chain drive. It is not clear why one skilled in the art and addressing the problem of reducing ambient sound adjacent to a surface would even consider Todd to be relevant to the problem. Nonetheless, these original claims have been cancelled and replaced with claims which are directed more specifically to the field of the invention. Similar considerations apply to original Claim 18, where the Examiner again introduces Wan's disclosure of a magnetostrictive actuator, which as observed above is not used in relation to sound.

In relation to original Claim 19, the Examiner suggests that the mere mention of a filter in Shoureshi renders obvious a system in which speech adjacent to the microphone is filtered out before a cancellation signal is applied. The abstract, to which the Examiner particularly refers, mentions only a *"variable bandwidth mechanical filter"*, which is quite different from a filter arranged to filter out speech adjacent to the microphone. The only mention of a filter in the body of Shoureshi is at Col 7, lines 25-30, where it is stated: *"To prevent generation of an error sequence that is auto-correlated with non-zero mean, a filter is added to the model on the equation error. This filter, whose parameters are initially unknown, serves to bring the residual bias to zero and to minimize its autocorrelation properties"*. It is submitted that this is clearly directed to something quite different from filtration of specific characteristics of a signal representing background noise. There is nothing in any of the cited documents which would lead a person skilled in the art to deduce that such a refinement might be obvious.

The reference to *"on-board"* at Column 3, lines 28-34 of Shoureshi, is, the Applicants submit, a reference to having the system installed in a vehicle, not to installing the system on or in relation to a bar or table-top, using that surface to radiate the anti-phase signal.

Original Claims 22-28 have been cancelled and these features are not included in any of the new claims, so the objections to these claims will not be discussed in detail.

Original Claims 29-34 all depended directly or indirectly from original Claim 2, and the points made above in relation to MacMartin et al and this claim apply equally here. While original

Claim 2 has been cancelled, along with these claims (29-34), and the new claims (35-44) are directed specifically to the invention.

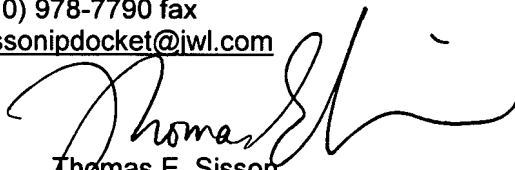
#### IV. CONCLUSION

Having noted and carefully addressed all of the outstanding rejections, Applicants respectfully submit that the application is in condition for allowance. Applicants have submitted herewith a request for a two-month extension of time and the required extension of time fee.

Respectfully submitted,

JACKSON WALKER, L.L.P.  
112 E. Pecan, Suite 2400  
San Antonio, TX 78205  
(210) 978-7700  
(210) 978-7790 fax  
[tsissonipdocket@jwl.com](mailto:tsissonipdocket@jwl.com)

By

  
Thomas E. Sisson  
Regis. No. 29,348

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